
	Division of Environmental Health and Communicable Disease Prevention	
	<b>Section: 4.0 Diseases and Conditions</b>	Revised 11/03
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## Cholera

### **Overview**<sup>(1,2)</sup>

Although many cases of cholera occur worldwide every year from natural causes, cholera is also a potential bioterrorism weapon. All cases reported in Missouri to date have been from naturally occurring causes. Contact your Regional Communicable Disease Coordinator immediately if you suspect that you are dealing with a bioterrorism situation.

For a complete description of cholera, refer to the following texts:

Control of Communicable Diseases Manual (CCDM).

Red Book, Report of the Committee on Infectious Diseases.

### **Case Definition**<sup>(3)</sup>

#### *Clinical description*

An illness characterized by diarrhea and/or vomiting; severity is variable.

#### *Laboratory criteria for diagnosis*

Isolation of toxigenic (i.e. cholera toxin-producing) *Vibrio cholerae* O1 or O139 from stool or vomitus, or

Serological evidence of recent infection

#### *Case classification*

*Confirmed:* a clinically compatible case that is laboratory confirmed

#### *Comment*


Illnesses caused by strains of *V. cholerae* other than toxigenic *V. cholerae* O1 or O139 should not be reported as cases of cholera. The etiological agent of a case of cholera should be reported as either *V. cholerae* O1 or *V. cholerae* O139.

### **Information Needed for Investigation**

**Verify the diagnosis.** What laboratory tests were conducted? What were the results? What laboratory conducted the testing and what is their phone number? What are the patient's clinical symptoms? What is the name and phone number of the attending physician?

**Establish the extent of illness.** Determine if household or other close contacts are, or have been ill, by contacting the health care provider, patient or family members.

**Determine the five-day food and water intake.**

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**Determine if the case had a history of recent foreign travel.** Cholera has a relatively short incubation period but the disease is very common in Latin America, Asia, Africa, and the countries of the former Soviet Union. Cholera is not endemic in North America and one case may be considered an outbreak.

**Contact the Regional Communicable Disease Coordinator.** If he/she is not immediately available, contact the Disease Investigation Unit's Duty Officer, (573)-751-6113.

### **Case/Contact Follow Up And Control Measures**

Determine the source of infection to prevent other cases:

Does the case or a member of the case's household attend or work in childcare, foodservice, or health care?

Identify symptomatic household and other close contacts and obtain stool specimens from them.

Has the case traveled to an endemic area or where a known outbreak is occurring?

Are there other cases linked by time, place or person?

Does the case engage in sexual or other practices that would put him/her or others at increased risk?

### **Control Measures**

See the Cholera section of the Control of Communicable Diseases Manual (CCDM), "Control of patient, contacts and the immediate environment".

See the Cholera section of the Red Book.

### **General:**

People infected with cholera and their ill contacts should be excluded from foodhandling and the care of children or patients until diarrhea ceases.


A search for unreported cases is recommended only among household members or those exposed to a possible common source.

### **Laboratory Procedures**

#### **Specimens:**

Testing of stool specimens is not routinely offered at the State Public Health Laboratory.

Preparations must be made to test these specimens. Contact the Regional Communicable Disease Coordinator or, in his/her absence, the Disease Investigation Unit for directions prior to collecting and shipping any specimens to the State Public Health Laboratory.

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## **Reporting Requirements**

Cholera is a Category I disease and shall be reported to the local health authority or to the Missouri Department of Health and Senior Services (DHSS) within 24 hours of first knowledge or suspicion by telephone (800) 392-0272, facsimile or other rapid communication.

1. For confirmed or probable cases, complete a "Disease Case Report" (CD-1).
2. Complete a "Cholera and Other Vibrio Illness Surveillance Report" (CDC 52.79).
3. Attach an additional sheet with a five-day food history for each case.
4. Entry of the completed CD-1 into the MOHSIS database negates the need for the paper CD-1 to be forwarded to the Regional Health Office.
5. Send the completed secondary investigation form(s) to the Regional Health Office.
6. All outbreaks or "suspected" outbreaks must be reported as soon as possible (by phone, fax or e-mail) to the Regional Communicable Disease Coordinator. This can be accomplished by completing the Missouri Outbreak Surveillance Report (CD-51).
7. Within 90 days from the conclusion of an outbreak, submit the final outbreak report to the Regional Communicable Disease Coordinator.

## **References**

1. Chin, James, ed. "Cholera." Control of Communicable Diseases Manual. 17<sup>th</sup> ed. Washington, DC: American Public Health Association, 2000: 100-108.
2. American Academy of Pediatrics. "Vibrio Infections." In: Pickering, L., ed. 2000 Red Book: Report of the Committee on Infectious Diseases, 25<sup>th</sup> ed. Elk Grove Village, IL. 2000: 638-640.
3. Centers for Disease Control and Prevention. Case Definitions for Infectious Conditions Under Public Health Surveillance. MMWR 1997;46 (No. RR-10): 10.
4. U.S. Army Medical Research Institute of Infectious Diseases. Medical Management of Biologic Casualties Handbook. 4th ed. July 2001.

## **Other Sources of Information**

1. Seas, Carlos and Gotuzzo Eduardo. "*Vibrio Cholerae*." Principles and Practice of Infectious Diseases, 5<sup>th</sup> ed. Eds. Gerald L. Mandell, John E. Bennett, & Raphael Dolin. New York: Churchill Livingstone, 2000: 2266-2272.
2. Tauxe, Robert V. "Cholera" Bacterial Infections of Humans Epidemiology and Control, 3<sup>rd</sup> ed. Eds. Alfred S. Evans and Philip S. Brachman. New York: Plenum, 1998: 223-239.

# **Cholera**

## **FACT SHEET**

### **What is cholera?**

Cholera is an acute, diarrheal illness caused by infection of the intestine with the bacterium *Vibrio cholerae*. The infection is often mild or without symptoms, but sometimes it can be severe. Approximately one in 20 infected persons will develop severe disease characterized by profuse watery diarrhea, vomiting, and leg cramps. In these persons, rapid loss of body fluids leads to dehydration and shock. Without treatment, death can occur within hours.

### **How does a person get cholera?**

A person may get cholera by drinking water or eating food contaminated with the cholera bacterium. In an epidemic, the source of the contamination is usually the feces of an infected person. The disease can spread rapidly in areas with inadequate treatment of sewage and drinking water.

The cholera bacterium may also live in the environment in brackish rivers and coastal waters. Shellfish eaten raw have been a source of cholera, and a few persons in the United States have contracted cholera after eating raw or undercooked shellfish from the Gulf of Mexico.

The disease is not likely to spread directly from one person to another; therefore, casual contact with an infected person is not a risk for becoming ill.

### **What is the risk for cholera in the United States?**

In the United States, cholera was prevalent in the 1800s but has been virtually eliminated by modern sewage and water treatment systems. The disease is still common today in other parts of the world, including the Indian subcontinent and sub-Saharan Africa.

As a result of improved transportation, more persons from the United States travel to parts of Latin America, Africa, or Asia where epidemic cholera is occurring. U.S. travelers to areas with epidemic cholera may be exposed to the cholera bacterium. In addition, travelers may bring contaminated seafood back to the United States; contaminated seafood brought into this country by travelers has caused foodborne outbreaks.

### **What should travelers do to avoid getting cholera?**

The risk for cholera is very low for U.S. travelers visiting areas with epidemic cholera. However, travelers should be aware of how the disease is transmitted and what can be done to prevent it. When simple precautions are observed, contracting the disease is unlikely.

All travelers to areas where cholera has occurred should observe the following recommendations:

Drink only water that you have boiled or treated with chlorine or iodine. Other safe beverages include tea and coffee made with boiled water and carbonated bottled beverages with no ice.

Eat only foods that have been thoroughly cooked and are still hot, or fruit that you have peeled yourself.

Avoid undercooked or raw fish or shellfish, including ceviche.

Make sure all vegetables are cooked--avoid salads.

Avoid foods and beverages from street vendors.

Do not bring perishable seafood back to the United States.

A simple rule of thumb is, "Boil it, cook it, peel it, or forget it. "

### **Is a vaccine available to prevent cholera?**

A vaccine for cholera is available; however, it confers only brief and incomplete immunity and is not recommended for travelers. There are no cholera vaccination requirements for entry or exit in any Latin American country or the United States.

### **Can cholera be treated?**

Although cholera can be life threatening, it is easily prevented and treated. Cholera can be simply and successfully treated by immediate replacement of the fluid and salts lost through diarrhea. Patients can be treated with oral rehydration solution, a prepackaged mixture of sugar and salts to be mixed with water and drunk in large amounts. This solution is used throughout the world to treat diarrhea. Severe cases also require intravenous fluid replacement. With prompt rehydration, less than 1% of cholera patients die.

Antibiotics shorten the course and diminish the severity of the illness, but they are not as important as rehydration. Persons who develop severe diarrhea and vomiting in countries where cholera occurs should seek medical attention promptly.

### **How long will the current epidemic last?**

Predicting how long the epidemic in Latin America will last is difficult. The cholera epidemic in Africa has lasted more than 20 years. In areas with inadequate sanitation, a cholera epidemic cannot be stopped immediately, and there are no signs that the epidemic in the Americas will end soon. Latin American countries that have not yet reported cases are still at risk for cholera in the coming months and years. Major improvements in sewage and water treatment systems are needed in many of these countries to prevent future epidemic cholera.

### **What is the U.S. government doing to combat cholera?**

U.S. and international public health authorities are working to enhance surveillance for cholera, investigate cholera outbreaks, and design and implement preventive measures. The Centers for Disease Control is investigating epidemic cholera wherever it occurs and is training laboratory workers in proper techniques for identification of *V.cholerae*. In addition, the Centers for Disease Control is providing information on diagnosis, treatment, and prevention of cholera to public health officials and is educating the public about effective preventive measures.

The U.S. Agency for International Development is sponsoring some of the international government activities and is providing medical supplies to affected countries.

The Environmental Protection Agency is working with water and sewage treatment operators in the United States to prevent contamination of water with the cholera bacterium.

The Food and Drug Administration is testing imported and domestic shellfish for *V. cholerae* and monitoring the safety of U.S. shellfish beds through the shellfish sanitation program.

With cooperation at the state and local, national, and international levels, assistance will be provided to countries where cholera is present, and the risk to U.S. residents will remain small.

### **Where can a traveler get information about cholera?**

The global picture of cholera changes periodically, so travelers should seek updated information on countries of interest. The Centers for Disease Control maintains a traveler's information telephone line that provides information on cholera and other diseases of concern to travelers. Data for this service are obtained from the World Health Organization. This number is 404-332-4559.

This Fact Sheet was developed from information provided by:

The Division of Bacterial and Mycotic Diseases  
National Center for Infectious Diseases  
Centers for Disease Control and Prevention  
1600 Clifton Road, Mailstop C09  
Atlanta, Georgia 30333

**Missouri Department of Health and Senior Services**  
**Section for Communicable Disease Prevention**  
**Phone: (866) 628-9891 or (573) 751-6113**

PATIENT'S NAME:		TEL.: (      )	Work (      )
ADDRESS:			
PHYSICIAN'S NAME:		TEL.: (      )	

— PATIENT IDENTIFIERS NOT TRANSMITTED TO CDC —

SEND COMPLETED REPORT TO STATE INFECTION CONTROL



## CHOLERA AND OTHER VIBRIO ILLNESS SURVEILLANCE REPORT

State will forward to: Centers for Disease Control and Prevention  
Foodborne and Diarrheal Diseases Branch M/S A38  
1600 Clifton Road  
Atlanta, GA 30333

### I. DEMOGRAPHIC AND ISOLATE INFORMATION

OMB 0920-0322 Exp. Date 12/31/2002

1. First three letters of patients first name: <div><div></div><div></div><div></div><div>(1-3)</div></div>		REPORTING HEALTH DEPARTMENT							
		State: <div><div></div><div></div><div>(4-5)</div></div>		City: (6-15)		County/Parish: (16-26)			
2. Date of birth: <div><div>Mo.</div><div>Day</div><div>Yr.</div><div>(58-63)</div></div>		3. Age: <div><div>Years</div><div>Mos.</div><div>(64-67)</div></div>		4. Sex: (68) <div><div><input type="checkbox"/> M (1)</div><div><input type="checkbox"/> F (2)</div><div><input type="checkbox"/> Unk. (9)</div></div>		5. Race/Ethnicity: (69) <div><div><input type="checkbox"/> White (not Hispanic) (1)</div><div><input type="checkbox"/> Black (not Hispanic) (2)</div><div><input type="checkbox"/> Hispanic (3)</div><div><input type="checkbox"/> Asian/Pacific Islander (4)</div><div><input type="checkbox"/> American Indian/Alaska Native (5)</div><div><input type="checkbox"/> Other: _____ (8)</div><div><input type="checkbox"/> Unk. (9)</div></div>		6. Occupation: (70-81) _____	
7. <i>Vibrio</i> species isolated (check one or more): Species		Source of specimen(s) collected from patient (If more than one specify earliest date)		Date specimen collected Mo. Day Yr.		If wound or other, specify site :			
		Stool Blood Wound Other							
<input type="checkbox"/> <i>V. alginolyticus</i> .....		<input type="checkbox"/> (82) <input type="checkbox"/> (83) <input type="checkbox"/> (84) <input type="checkbox"/> (85)		<div><div></div><div></div><div></div></div> (86-91)		_____ (92-103)			
<input type="checkbox"/> <i>V. cholerae</i> O1 .....		<input type="checkbox"/> (104) <input type="checkbox"/> (105) <input type="checkbox"/> (106) <input type="checkbox"/> (107)		<div><div></div><div></div><div></div></div> (108-113)		_____ (114-125)			
<input type="checkbox"/> <i>V. cholerae</i> O139 .....		<input type="checkbox"/> (126) <input type="checkbox"/> (127) <input type="checkbox"/> (128) <input type="checkbox"/> (129)		<div><div></div><div></div><div></div></div> (130-135)		_____ (136-147)			
<input type="checkbox"/> <i>V. cholerae non-O1, non-O139</i> .....		<input type="checkbox"/> (148) <input type="checkbox"/> (149) <input type="checkbox"/> (150) <input type="checkbox"/> (151)		<div><div></div><div></div><div></div></div> (152-157)		_____ (158-169)			
<input type="checkbox"/> <i>V. cincinnatiensis</i> .....		<input type="checkbox"/> (170) <input type="checkbox"/> (171) <input type="checkbox"/> (172) <input type="checkbox"/> (173)		<div><div></div><div></div><div></div></div> (174-179)		_____ (180-191)			
<input type="checkbox"/> <i>V. damsela</i> .....		<input type="checkbox"/> (192) <input type="checkbox"/> (193) <input type="checkbox"/> (194) <input type="checkbox"/> (195)		<div><div></div><div></div><div></div></div> (196-201)		_____ (202-213)			
<input type="checkbox"/> <i>V. fluvialis</i> .....		<input type="checkbox"/> (214) <input type="checkbox"/> (215) <input type="checkbox"/> (216) <input type="checkbox"/> (217)		<div><div></div><div></div><div></div></div> (218-223)		_____ (224-235)			
<input type="checkbox"/> <i>V. furnissii</i> .....		<input type="checkbox"/> (236) <input type="checkbox"/> (237) <input type="checkbox"/> (238) <input type="checkbox"/> (239)		<div><div></div><div></div><div></div></div> (240-245)		_____ (246-257)			
<input type="checkbox"/> <i>V. hollisae</i> .....		<input type="checkbox"/> (258) <input type="checkbox"/> (259) <input type="checkbox"/> (260) <input type="checkbox"/> (261)		<div><div></div><div></div><div></div></div> (262-267)		_____ (268-279)			
<input type="checkbox"/> <i>V. metschnikovii</i> .....		<input type="checkbox"/> (280) <input type="checkbox"/> (281) <input type="checkbox"/> (282) <input type="checkbox"/> (283)		<div><div></div><div></div><div></div></div> (284-289)		_____ (290-301)			
<input type="checkbox"/> <i>V. mimicus</i> .....		<input type="checkbox"/> (302) <input type="checkbox"/> (303) <input type="checkbox"/> (304) <input type="checkbox"/> (305)		<div><div></div><div></div><div></div></div> (306-311)		_____ (312-323)			
<input type="checkbox"/> <i>V. parahaemolyticus</i> .....		<input type="checkbox"/> (324) <input type="checkbox"/> (325) <input type="checkbox"/> (326) <input type="checkbox"/> (327)		<div><div></div><div></div><div></div></div> (328-333)		_____ (334-345)			
<input type="checkbox"/> <i>V. vulnificus</i> .....		<input type="checkbox"/> (346) <input type="checkbox"/> (347) <input type="checkbox"/> (348) <input type="checkbox"/> (349)		<div><div></div><div></div><div></div></div> (350-355)		_____ (356-367)			
<input type="checkbox"/> <i>Vibrio</i> species - not identified .....		<input type="checkbox"/> (368) <input type="checkbox"/> (369) <input type="checkbox"/> (370) <input type="checkbox"/> (371)		<div><div></div><div></div><div></div></div> (372-377)		_____ (378-389)			
<input type="checkbox"/> Other (specify): _____ (390-405)		<input type="checkbox"/> (406) <input type="checkbox"/> (407) <input type="checkbox"/> (408) <input type="checkbox"/> (409)		<div><div></div><div></div><div></div></div> (410-415)		_____ (416-427)			
8. Were other organisms isolated from the same specimen that yielded <i>Vibrio</i> ? Specify organism(s): _____ (429-450)				9. Was the identification of the species of <i>Vibrio</i> (e.g., <i>vulnificus</i> , <i>fluvialis</i> ) confirmed at the State Public Health Laboratory? Yes (1) No (2) Unk. (9) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> (451)					
10. Complete the following information if the isolate is <i>Vibrio cholerae</i> O1 or O139:									
Serotype (452) (check one)		Biotype (453) (check one)		Toxigenic? (454) (check one) If YES, toxin positive by: (check all, that apply)					
<div><div><input type="checkbox"/> Inaba (1)</div><div><input type="checkbox"/> Ogawa (2)</div><div><input type="checkbox"/> Hikojima (3)</div><div><input type="checkbox"/> Not Done (4)</div><div><input type="checkbox"/> Unk. (9)</div></div>		<div><div><input type="checkbox"/> El Tor (1)</div><div><input type="checkbox"/> Classical (2)</div><div><input type="checkbox"/> Not Done (3)</div><div><input type="checkbox"/> Unk. (9)</div></div>		<div><div><div>Yes (1)</div><div>No (2)</div><div>Unk. (9)</div></div><div><input type="checkbox"/> ELISA (455)</div><div><input type="checkbox"/> Latex agglutination (456)</div><div><input type="checkbox"/> Other (specify): _____ (457-471)</div></div>					





(OVER)

For each seafood ingestion investigated, please complete as many of the following questions as possible.  
(Include additional pages section IV if more than one seafood type was ingested and investigated.)

## 1. Type of seafood (e.g., clams):

Date consumed:

Mo.	Day	Yr.
<input type="text"/>	<input type="text"/>	<input type="text"/>

Time consumed:

Hour	Min.	<input type="checkbox"/> am (1)	<input type="checkbox"/> pm (2)
<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>

Amount consumed:

(1464-1480)

(1481-1486)

(1487-8)

(1489-90)

(1491)

(1492-1512)

If patient ate multiple seafoods in the 7 days before onset of illness, please note why this seafood was investigated (e.g., consumed raw, implicated in outbreak investigation):

## 2. How was this fish or seafood prepared? (1513)

<input type="checkbox"/> Raw (1)	<input type="checkbox"/> Baked (2)	<input type="checkbox"/> Boiled (3)	<input type="checkbox"/> Broiled (4)	<input type="checkbox"/> Fried (5)	<input type="checkbox"/> Steamed (6)	<input type="checkbox"/> Unk. (9)	<input type="checkbox"/> Other (8) (specify): <input type="text"/>
----------------------------------	------------------------------------	-------------------------------------	--------------------------------------	------------------------------------	--------------------------------------	-----------------------------------	--

(1514-1530)

## 3. Was seafood imported from another country?

Yes (1)	No (2)	Unk. (9)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If YES, specify

exporting country if known: 

(1532-1554)

## 4. Was this fish or shellfish harvested by the patient or a friend of the patient?

Yes (1)	No (2)	Unk. (9)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(If YES, go to question 12.)

(1555)

## 5. Where was this seafood obtained? (1556) (Check one)

<input type="checkbox"/> Oyster bar or restaurant (1)	<input type="checkbox"/> Seafood market (4)	<input type="checkbox"/> Unk. (9)
<input type="checkbox"/> Truck or roadside vendor (2)	<input type="checkbox"/> Other (8)	
<input type="checkbox"/> Food store (3)	(specify): <input type="text"/>	

(1557-1590)

## 6. Name of restaurant, oyster bar, or food store:

Tel.:

( )

Address:

## 7. If oysters, clams, or mussels were eaten, how were they distributed to the retail outlet? (1591)

<input type="checkbox"/> Shellstock (sold in the shell) (1)	<input type="checkbox"/> Shucked (2)	<input type="checkbox"/> Unk. (9)	<input type="checkbox"/> Other (8) (specify): <input type="text"/>
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(1592-1610)

## 8. Date restaurant or food outlet received seafood:

Mo.	Day	Yr.
<input type="text"/>	<input type="text"/>	<input type="text"/>

(1611-1616)

## 9. Was this restaurant or food outlet inspected as part of this investigation?

Yes (1)	No (2)	Unk. (9)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(1617)

## 10. Are shipping tags available from the suspect lot? (1618)

Yes (1)	No (2)	Unk. (9)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(Attach copies if available)

## 11. Shippers who handled suspected seafood: (please include certification numbers if on tags)


## 12. Source(s) of seafood:


## 13. Harvest site:

Date:

Mo.	Day	Yr.
<input type="text"/>	<input type="text"/>	<input type="text"/>

(1619-1639)

(1640-1645)

Status:

<input type="checkbox"/> Approved (1)	<input type="checkbox"/> Conditional (3)
<input type="checkbox"/> Prohibited (2)	<input type="checkbox"/> Other (8) (specify): <input type="text"/>

(1646)

(1647-1666)

<input type="checkbox"/> Approved (1)	<input type="checkbox"/> Conditional (3)
<input type="checkbox"/> Prohibited (2)	<input type="checkbox"/> Other (8) (specify): <input type="text"/>

(1694)

(1695-1714)

## 14. Physical characteristics of harvest area as close as possible to harvest date:

Result

Date Measured

Maximum ambient temp. .... (1715-1718)

<input type="checkbox"/> F (1)	<input type="checkbox"/> C (2)
<input type="text"/>	<input type="text"/>

(1719)

Mo.	Day	Yr.
<input type="text"/>	<input type="text"/>	<input type="text"/>

(1720-1725)

Surface water temp. .... (1726-1727)

<input type="checkbox"/> F (1)	<input type="checkbox"/> C (2)
<input type="text"/>	<input type="text"/>

(1728)

Mo.	Day	Yr.
<input type="text"/>	<input type="text"/>	<input type="text"/>

(1729-1734)

Salinity (ppt) .... (1735-1736)

Mo.	Day	Yr.
<input type="text"/>	<input type="text"/>	<input type="text"/>

(1737-1742)

Total rainfall (inches in prev. 5 days) .... (1743-1744)

Mo.	Day	Yr.
<input type="text"/>	<input type="text"/>	<input type="text"/>

(1745-1750)

Fecal coliform count .... (1751-1755)

Mo.	Day	Yr.
<input type="text"/>	<input type="text"/>	<input type="text"/>

(1756-1761)

(Attach copy of coliform data)

## 15. Was there evidence of improper storage, cross-contamination, or holding temperature at any point?

Yes (1)	No (2)	Unk. (9)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(1762)

If YES, specify deficiencies:


## Person completing section IV:

Date:

Mo.	Day	Yr.
<input type="text"/>	<input type="text"/>	<input type="text"/>

(1763-1768)

## Title/Agency:

Tel.:

( )